CARDIOVASCULAR CHANGES IN CHRONIC HEPATOCHOLECYSTOPATHY IN CHILDHOOD

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Chronic diseases of the biliary tracts rarely occur isolated. Very often, the pathological process involves the liver and the organs of the digestive system. Other systems of the organism (nervous, endocrine, cardiovascular etc) are also being affected, as well as the total immunobiological reactivity (R. A. Kalyuznaia). A number of experimental investigations and clinical observations show that the gall-bladder and biliary tracts constitute a powerful reflexogenic zone and their affection influences a number of organs and systems, including the cardiovascular system (I. M. Gandja, E. I. Druzhinina, H. Iwasaki, J. Havranek, De La Casac Alonso). The acute or chronic stimulation of the interoreceptors of the biliary tracts by the pathological process accounts for a number of changes in the heart, coronary vessels and total circulation. This gave sufficient reason to B. P. Kushalevskii (1963) to propose the term «cholecystocoronary syndrome» for reflectory stenocardia designation in affections of the biliary tracts. Later, A. M. Nogaller (1969) introduced the extended conception «cholecystocardial syndrome» which incorporates the possibility for the occurrence not merely of the coronary, but also of the metabolic-dystrophic and neuro-humoral derangements within the myocardium in diseases of the bile secreting system. The clinical study carried out by R. A. Vershgub on atypical angiocholecystitis in children, running a course characterized by the presence of a «rheumatic disguise», demonstrates differential diagnostical difficulties in these conditions.

According to literature data, the incidence of cardiovascular changes in children with chronic hepatocholecystopathies shows considerable variation (from 5% according to M. Y. Studenikin up to 60% after V. D. Chebotarev and Z. N. Poltorazkaya). In the Western literature surveyed and in pertinent Bulgarian literature as well investigations of the kind in childhood were not found. This warranted the tracing up of the cardiovascular changes in our children with chronic hepatocholecystopathy, undergoing treatment in the clinic over the past four years.

Clinical Material and Investigation Methods

To trace the cardiovascular changes, 58 children aged 3—14 years (22 boys and 36 girls) with affections of the gallbladder and biliary tracts (Lambliosis hepatobiliaris, Cholangiocholecystitis bact. chr., Dyskinesia bilia-

ris) were clinically observed and investigated. The children with previously sustained disorders of the cardiovascular system, due to other diseases, and the children with infectious hepatitis in the past history were excluded of the group under investigation. Table 1 illustrates the number (%) of the

Table 1

Number (%) of investigated children with chronic hepatocholecystopathy, distributed according to age groups and types of affections

Age groups	Investigated children	Lambliosis hepatobiliaris	Cholangiochole-cystitis bact. chr.	Cholangiochole-cyst. lambliosis	Dyskinesia biliaris
Group I 3—6	11 (19%)	4 (36%)	—	6 (55%)	1 (9%)
Group II 7—10	28 (48%)	14 (50%)	3 (11%)	7 (25%)	4 (15%)
Group III 11—14	19 (33%)	6 (31%)	4 (21%)	9 (47%)	—
Total	58 (100%)	24 (42%)	7 (12%)	22 (38%)	5 (9%)

studied children, distributed according to age groups and type of affections. It is obvious from the table that in the children observed, lambliosis hepatobiliaris (42%) and cholangiocholecystitis bact. with lambliosic invasion (38%) were the conditions most frequently met with. Pure bacterial cholangiocholecystitis (12%) and dyskinesiae of the biliary tracts (9%) are recorded much more rarely. The hepatobiliary form of lambliosis (50%) and the primary dyskinesiae of the biliary tracts (15%) are noted most frequently in the age group 7—10 years, and the bacterial cholangiocholecystitis with lambliosic invasion is recorded most frequently in age group I (55%) and age group III (47%).

According to the duration of the disease, the children are distributed in the following fashion: from 1 to 6 m. — 14 children, 6-12 m. — 7 children, 1-3 years — 26 children, older than 3 years — 6 children, with obscure onset of the disease — 5 children. Twenty four children were with proved concomitant focal infection, of which: chronic tonsillitis — 16, paranasal sinus inflammations — 5 and with evidence for focal infection of dental origin — 3 children.

Upon admission to the clinic, the children reported pain complaints in the abdomen with predominant localization in the rightside subcostal area (93%), loss of apetite (51%), nausea and vomiting (39%), changes in defecation (16%). Disturbed general condition (pale skin, feebleness, losing weight) was observed in 17% of the children, allergic rashes — 7%, subfevrile state — 38%, nervous manifestations (headache, irritability, insomnia, psycholability) — 48%, pains in the limbs and joints — 14%, periodical complaints of heaviness, shooting pains in the heart area and tachycardia — 11%. Enlargement of the liver was recorded in 96%, of the spleen — 26%; accelerated erythrocyte sedimentation rate — 62% and leukocytosis — 31%. Therefore, the most frequently observed clinical manifestations among the children with affections of the biliary tracts were: abdominal pain, loss of apetite, subfebrile state (temperature), hepatomegaly, nervous manifestations and speeded up erythrocyte sedimentation rate (ESR).

Parallel to the routine paraclinical investigations of the blood picture, urine, colloid-stability reactions, transaminases, proteinogram, blood bilirubin and the like, all the children were subjected also to fractional minute duodenal probing, investigation of the bile — A, B, C for lamblii, bacteriologic and cytological investigation. Cholangiocholecystographies with «Biligraphin» as contrast matter were made in most of the children. Among the cases with rheumatoid manifestations, a complex of biochemical indices were investigated, including serum glycoproteins for ruling out a rheumatic affection. To follow up the cardiovascular changes, along with the thorough physical cardiac status and X-ray study of the heart, the blood pressure was also regularly measured and electrocardiograms taken with standard, unipolar and precordial leads. The electrocardiograms were made with a three-canal Hellige apparatus, at movement of the band 50 mm/sec and standard amplification 1 mv. Interpretation of the ECG was made on the basis of the normatives for children, submitted by R. Mazo, R. Zuckermann and the special tables of Lepeschkin, Michel, Albers and Urban.

The mean hospitalization period of the children was about $1^1/_2$ months during which they were treated with diet, antibiotics, antilambliosis means, bile driving drugs, spasmolytics, general tranquilizing means, vitamins, physical agents, etc.

All 58 children underwent follow-up study and ECG-investigations from 6—12 months to 3 years after dismissal from the clinic.

The data obtained concerning cardiovascular changes in the series reviewed were treated after the variation statistical method.

Results of the Investigations

The most frequently met with cardiovascular changes in the children with chronic hepatocholecystopathies are illustrated in Table 2. Changes in the heart configuration were not discovered in the children investigated

Table 2

Cardiovascular changes in children with chronic hepatocholecystopathy, distributed according to type of affection

Symptoms	Lambliosis hepatobiliaris	Cholangiochole-cyst. bact. chr.	Cholangiochole-cyst+lambliosis	Dyskinesia biliaris	Total
Investigated children	24 (42%)	7 (12%)	22 (38%)	5 (9%)	58 (100%)
Dull sounds	2 (8%)	1 (14%)	5 (23%)	—	8 (14%)
Tachycardia	10 (42%)	2 (23%)	13 (59%)	1 (20%)	26 (45%)
Bradycardia	2 (8%)	3 (13%)	3 (14%)	—	8 (14%)
Systolic sound at the heart apex	8 (33%)	4 (57%)	13 (59%)	2 (40%)	27 (46%)
Arterial hypotonia	14 (58%)	3 (43%)	15 (68%)	2 (40%)	34 (59%)
ECG changes	17 (71%)	5 (70%)	15 (68%)	4 (80%)	41 (71%)

(58). Dull sounds were established in 14%, tachycardia — 45%, bradycardia — 14%, systolic sound at the heart apex — 46%, arterial hypoto-

nia — 59%, ECG changes — 71%. It is evident from Table 2 that most of the cardiovascular changes are established among children with bacterial cholangiocholecystitis associated with lambliose invasion. Whereas ECG changes are encountered practically equally often in the various types of affections, the dull sounds, tachycardia, systolic sound and arterial hypotonia are noted more frequently in children with combined affection by bacterial cholangiocholecystitis and hepatobiliary lambliosis. In the group of children with hepatobiliary form of lambliosis, free of bacterial infection, tachycardia and arterial hypotonia are most frequently noted, whilst in children with bacterial cholangiocholecystitis without lambliosis, bradycardia and systolic sound at the heart apex are more often observed. Among the group of children with primary dyskinesiae of the biliary

Table 3

Cardiovascular changes in children with chronic hepatocholecystopathy distributed according to age groups

Symptoms / Age	Investigated children	Dull sounds	Tachycardia	Bradycardia	Systolic sound	Arterial hypotonia	ECG changes
3—6 r.	11 (19%)	2 (18%)	5 (45%)	2 (18%)	4 (36%)	8 (72%)	7 (64%)
7—10 r.	18 (48%)	4 (14%)	13 (46%)	3 (11%)	14 (50%)	16 (57%)	19 (61%)
11—14 r.	19 (33%)	2 (10%)	8 (42%)	3 (16%)	9 (17%)	10 (53%)	15 (79%)
Total	58 (100%)	8 (14%)	26 (45%)	8 (14%)	27 (46%)	34 (59%)	41 (71%)

Electrocardiographic changes in children with chronic

ECG changes / Hepatocholecystopathy	Investigated children	Changes in P	PQ elongation	Changes in R	QRS extension
Lambliosis hepatobiliaris	24 42%	2 8%	— —	8 33%	2 8%
Cholangiocholecyst. bact. chr.	7 12%	2 29%	— —	2 29%	— —
Cholangiocholecyst.+lambliosis	22 38%	3 14%	2 9%	6 27%	1 5%
Dyskinesia biliaris	5 9%	1 20%	— —	2 40%	— —
Total	58 100%	8 14%	2 3%	18 30%	3 5%

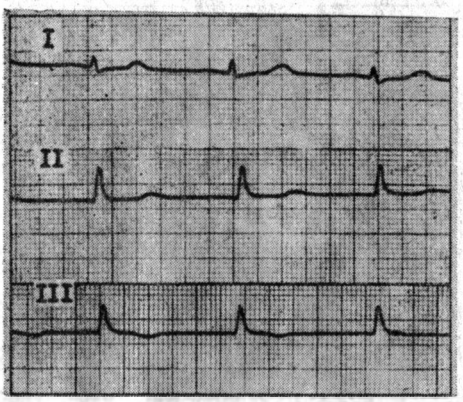

Fig. 1. Katya R. H., aged 9 (case history № 6087/1968) with Dyskinesia biliaris

ECG — indifferent type, sinus rhythm, fr. 100, reduction of P-waves in all leads (weakly outlined P-waves in lead I, and isoelectric line in leads II and III). Slight lowering of QRS-complexes and T waves

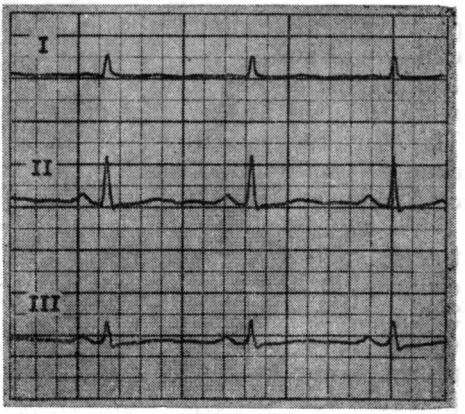

Fig. 2. Margarita L. L., aged 14 (case history № 6577/1969) with Cholecystitis bact. chr.

ECG — indifferent type, sinus rhythm, fr. 85, high P waves in II and III leads, lowering of T waves in all the leads

tracts, ECG changes are comparatively more often established, whereas the other cardiovascular changes are much rarer.

Table 3 illustrates the cardiovascular changes in children with chronic hepatocholecystopathiae, distributed according to age groups. While dull sounds, bradycardia and arterial hypotonia are recorded com-

Table 4

hepatocholecystopathy, distributed according to type of disease

ST lowering	Changes in T	QT elongation	Arrhythmia	Tachycardia	Bradycardia	Electrical axis deflection		Unchanged
						to the right	to the left	
1 4%	14 58%	10 42%	8 33%	10 42%	2 8%	1 4%	— —	5 21%
— —	4 57%	5 71%	2 29%	2 29%	3 43%	1 14%	1 14%	3 43%
2 9%	12 54%	16 73%	11 50%	13 59%	3 14%	2 9%	— —	7 32%
— —	1 20%	2 40%	1 20%	1 20%	— —	— —	— —	2 40%
3 5%	31 53%	33 57%	22 38%	26 45%	8 14%	4 7%	1 2%	17 29%

paratively more frequently in the children of age-group I (3—6 years), tachycardia and systolic sound are more frequent in the other groups. The highest percentage of ECG changes were established in the children aged 11 to 14 years.

As we aimed a more detailed tracing of the electrocardiographic changes in the affected children, 235 electrocardiograms were made (averaging 4 ECG per child). The results of our studies are illustrated in Table 4.

Changes in the P wave (as an expression of disturbed action potentials' conduction in the heart atria) were noted in 8 children (14%), of which decrease and deflection of the P wave — in 5 children (Fig. 1) and high P-wave — in 3 children (Fig. 2).

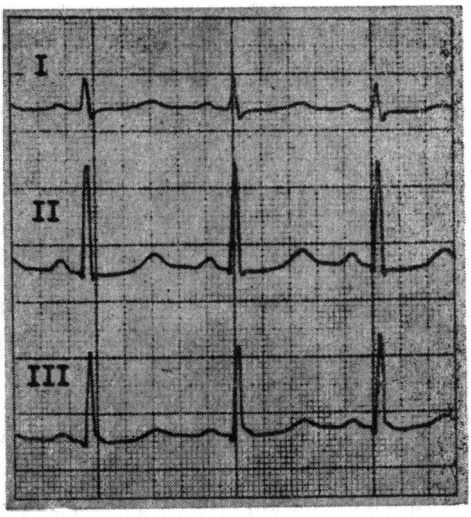

Fig. 3. Radko M. G., aged 5 (case history № 6806/1970) with Lambliosis hepatobiliaris

ECG-indifferent type, sinus rhythm, fr. 120, sinus tachycardia, relative elongation of PQ=0.17″(140%)

Changes in the PQ interval (as an expression of impaired atrioventricular conductivity) was recorded in 6 children (10%), of which relative prolongation of PQ in 2 children (Fig. 3) and shortening of the PQ interval beneath 0.10″ — in 4 children (Fig. 4).

Changes in the R tooth were observed in 18 children (30%), of which reduction of R in all leads — in 5 children (Fig. 1), high R teeth — in 4 children (Fig. 5), splitting and identation of R (in more than one leads) —

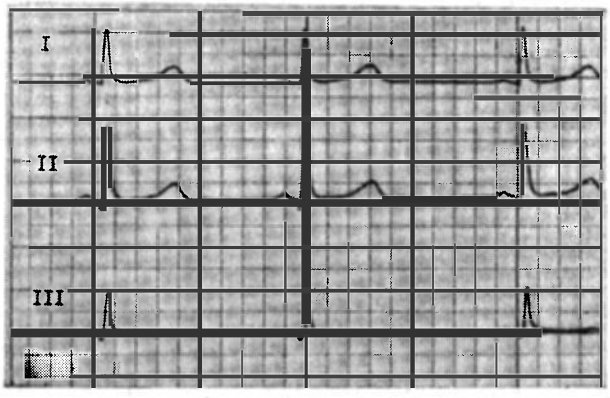

Fig. 4. Dafinka A. A. aged 14 (case history № 5302/1969) with Cholecystitis bact. chr., Lambliosis hepatobiliaris.

ECG — indifferent type, sinus rhythm, fr.65—55, sinus bradyarrhythmia, shortening of PQ=0.10″ (65%), lengthening of QT=0.42″ (125%)

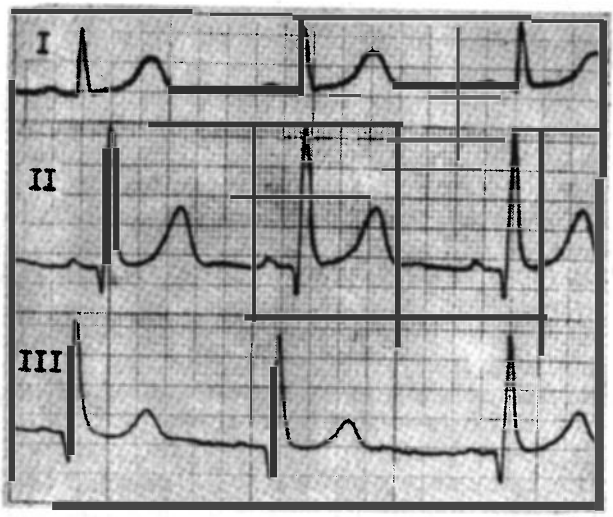

Fig. 5. Gina G. K. aged 10 (case history № 5176/1969) with Lambliosis hepatobiliaris

ECG — indifferent type, sinus rhythm, fr. 70—80, sinus arrhythmia, high R teeth, high and acute T waves, slight expansion of QRS=0.09″ (122%)

in 9 children (as an expression of slight disorders in the intraventricular conductivity). The extension of QRS complexes provides more convincing data about disturbed intraventricular conductivity (Fig. 5), recorded in 3 children of our series (5%).

Lowering of the ST segments (Fig. 6) as an expression of lesional changes within the myocardium were discovered also in 3 children (5%). More of the ECG changes were recorded in the T wave (as an expression of disturbed repolarization in the myocardium). Changes in the T wave were established in 31 children (53%), of which lowering and deformation of T—26 children (Figs. 1, 2, 6), high and sharp T waves — in 5 children (Fig. 3).

The relative lengthening of the QT interval (electric systole) is registered as a manifestation of disturbed functional capacity of the myocardium. In our case material, lengthening of the QT-time (Figs. 4, 6) was established in 33 children (57%).

Changes in the heart rhythm were found in 34 children, of which sinus

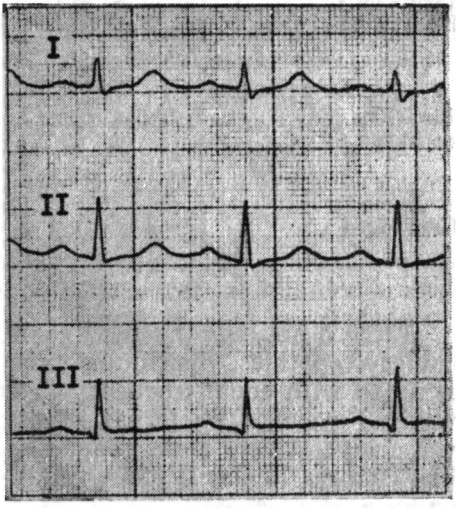

Fig. 6. Irena M. S. aged 6 (case history № 22328/1969) with Lambliosis hepatobiliaris

ECG — indifferent type, sinus rhythm, fr. 120, sinus tachycardia, slight lowering of the ST segment and T waves, lengthening of QT=0.34″ (125%)

tachycardia (Figs. 3, 6) — in 26 children (45%), sinus bradycardia (Fig. 4) — in 8 (14%) and sinus arrhythmia (Figs. 4, 5) — in 22 children (38%). Atrial or ventricular (chamber) extrasystoles in our series were not recorded. The electrical axis deflection to the left- or rightside is explained by the age-related and constitutional peculiarities of the children under investigation. Seventeen children were without ECG changes (29%). The highest percentage of ECG changes were recorded in the group of children with bacterial cholangiocholecystitis and concomitant lambliase invasion, while the least changes were established in the children with primary dyskinesiae of the biliary tracts.

Table 5

Electrocardiographic changes in children with chronic hepatocholecystopathy, distributed according to age groups

ECG changes \ Age groups		Group I 3—6 y.	Group II 7—10 y.	Group III 11—14 y.	Total
Investigated children		11 (19%)	28 (48%)	19 (33%)	58 (100%)
Changes in P		1 (9%)	4 (14%)	3 (16%)	8 (14%)
PQ elongation		1 (9%)	—	1 (5%)	2 (3%)
Changes in R		5 (45%)	6 (21%)	7 (37%)	18 (30%)
QRS extension		—	2 (7%)	1 (5%)	3 (5%)
ST lowering		1 (9%)	—	2 (10%)	3 (5%)
Changes in T		6 (54%)	13 (46%)	12 (63%)	31 (53%)
QT elongation		7 (64%)	12 (43%)	14 (73%)	33 (57%)
Arrhythmia		4 (36%)	7 (25%)	11 (58%)	22 (38%)
Tachycardia		5 (45%)	13 (46%)	8 (42%)	26 (45%)
Bradycardia		2 (18%)	3 (11%)	3 (16%)	8 (14%)
Electr. axis deflection	rightside	1 (9%)	1 (4%)	2 (10%)	4 (7%)
	leftside	—	1 (4%)	—	1 (2%)
Unchanged		4 (36%)	9 (32%)	4 (21%)	17 (29%)

Table 5 presents the ECG changes in the children with chronic hepatocholecystopathies, distributed according to age groups. While tachycardia is noted with equal frequency in all the age groups, the changes in the P wave, T wave, QT-interval lengthening and sinus arrhythmia were observed comparatively more frequently in the third age group (11 to 14 years). The changes in the R tooth, the PQ interval and sinus bradycardia lengthening were more common in children aged 3—6 years.

All the cardiovascular and ECG changes referred to above and observed in our series, were traced in dynamics and compared not only with the types of diseases of the biliary tracts and age groups, but also with the duration of the affection, involvement of the liver and with the concomitant focal infection — all factors considered as having direct or indirect influence on the cardiovascular system.

In the children with 6-month duration of the disease, the variations of the cardiovascular system were insignificant. The most frequently met with changes in this group involved arterial hypotonia and sinus tachycardia, which were promptly normalized after the treatment. Among the children with duration of disease exceeding 1 year, the cardiovascular changes were established substantially more often. Along with arterial hypotonia and sinus tachycardia, in isolated cases, dullness of the heart sounds was eventually detected and much more often — heart apex systolic sound. The ECG changes were more clear cut and persisting for longer time. Most clearly outlined were the cardiovascular changes in children with long-standing disease, exceeding 3 years, which hardly responded to the treatment of the basic affection performed.

A group of 24 patients with concomitant focal infection (chronic tonsillitis — 16, inflammation of the paranasal sinuses — 5 and with evidence for dental infection — 3) received particular attention in the course of investigations. The comparative study of the two groups of children — with and without focal infection — demonstrated that the variations in the cardiovascular system are recorded with virtually equal incidence. Anyway, followed in dynamics, the cardiovascular changes in the children with concomitant focal infection, and particularly those with chronic tonsillitis, persisted for longer period of time, were but slightly influenced by the treatment carried out and, in some of the children, the physical heart finding and the ECG changes remained unaltered up to the end of the observation period.

Particularly frequent and substantially more severe were the changes in the cardiovascular system of children with evidence of liver involvement (11 children). Here the hepatomegaly persisted for a long time and the paraclinical investigations provided evidence for affection of the hepatic parenchyma. In this group of children, the cardiovascular changes were of long duration and were insignificantly influenced by the treatment resorted to. Particularly tenacious were the cardiovascular and ECG changes when combinations of chronic affection of the biliary tracts with involvement of the liver and chronic tonsillitis were concerned (7 children).

The check-up and ECG examinations performed after the treatment of chronic hepatocholecystopathic cases and the tracing of the cardiovascular changes 6—12 months to 3 years after the dismissal of the children from the clinic have shown: disappearance of the arterial hypotonia and normalization of the blood pressure in 82%, negative physical finding of the heart in 58% and reduction of ECG changes in 67% of the affected children.

Discussion

Proceeding from literature data (R. A. Kalyuzhnaya, E. I. Chazov and others) and from personal observations on children with chronic diseases of the biliary tracts, it might be stated that these affections never remain isolated, but rather influence and induce a number of changes in other organs and systems, without sparing the cardiovascular system. The cardiovascular changes in some of the children are strongly pronounced and emerge

in the foreground of the clinical course run by the disease by accounting for a number of differential diagnostical difficulties. The pains in the limbs and joints, the periodic complaints of heaviness, shooting pains in the heart area and tachycardia, subfebrile temperature, physical heart findings and ECG changes, accelerated ESR and not infrequent combination with chronic tonsillitis all contribute for the establishment of mistaken diagnoses, as for instance rheumocarditis, infectious myocarditis, rheumatoid polyarthritis, tonsillogenic intoxication etc. For better illustration, we report the following case histories of some of the children in our series:

Case report I — Rositza J. B., 4 years, case history No. 5027/26. 3. 1968 and No. 703/10. 1. 1970.

A child is concerned reared among other children. Affected by the illness 1 month before admission to the clinic with articular pains, constant lack of apetite, vomiting and pains in the right subcostal area. Admitted to the clinic with suspected tonsillogenic intoxication and rheumatism.

Objective state — pale, feeble child with dark lines under the eyes. Pathological changes of the joints were not established. Abdomen-palpatory painfulness in the right subcostal area and hepatomegaly — liver 4 cm beneath the costal arch, with increased density.

Heart — pure and clearcut sounds. Tachycardia (frequency 110). ECG without pathological variations. ESR — 40 mm after Panchenko. The other indices for rheumatic activity within normal limits. Evidence of chronic tonsillitis are not established.

Duodenal probe — mass amassments of lamblii in bile A, B and C. Pathogenic flora was not isolated. After the treatment of lambliosis performed, the general state of the child was improved, the articular complaints and tachycardia subsided, the liver was back within the costal arch.

After a period free of complaints, lasting $1^1/_2$ year, the child reported a second time the same complaints. Systolic sound at the heart apex and arterial hypotonia — 80/50 were established. ECG — without pathological changes. Liver — $3^1/_2$ beneath the costal arch.

The duodenal sounding confirmed the recurrence of Lambliosis. Aerobacter was isolated from the B gallbladder. After repeating the antilambliosis treatment, the subjective complaints disappeared and the objective findings got normalized. Four months later the child had no complaints whatsoever.

The general intoxication, the articular syndrome and the changes involving the cardiovascular system in this case might be explained by recurrent Lambliosis.

Case report II — Ivanka M. Ch., 13 years, case history No. 19466/15. 10. 1968. She has complaints, dating back about 1 year, of abdominal pains localized in the right subcostal area. Two months before admission to the clinic, the other manifestations appeared which were the reason for being referred for consultation to the rheumocardiological office and thereafter hospitalized: easy fatigability, pains in the heart region, transitory articular pains.

Objective state — heart: without pathological physical finding. Joints — no changes. Palpatory painfulness in the area of the gallbladder and epigastrium; liver — 2 cm distant, spleen — $1^1/_2$ cm beneath the costal arch.

ECG — indifferent type, sinus rhythm, frequency 75, slight reduction of the T waves in all the leads, elongation of the QT interval=0.40". Arterial hypotonia — 100/65. ESR — 6 mm, no data available for rheumatic activity.

Enterobiosis and cholo-hepatic form of Lambliosis were established. From the B bile, Bact. proteus was isolated; in the sediment, besides lamblii also elements of inflammation were detected.

After the treatment of the basic disease the complaints ceased, and the objective finding was normalized. At the follow-up examination, 1 year after the discharge, the child was free of complaints. Heart — within normal limits. Blood pressure — 120/80. ECG — without variations from the norm. Liver and spleen — not palpated.

This case concerns a combined parasitosis, complicated by bacterial cholecystitis, running a clinical course with rheumatic manifestations and ECG changes without paraclinical data for rheumatic activity.

Case report III — Konstantine A. N., 11 years, case history No. 2462/7. 2. 1968.

Complaining of transitory pains in the joints, sometimes accompanied by swelling of the joints, dating back several years ago. He was controlled by a rheumocardiologist for suspected rheumatoid arthritis and hospitalized several times. Because of hepatosplenomegaly established and recurrent abdominal pains, he was subjected to duodenal sounding — as a result, diagnosis lambliosis was accepted and the child accordingly treated. After a period free of symptoms, the articular complaints reappeared and the child was readmitted to the clinic.

Objective state — palpatory painfulness in the area of the gallbladder and hepatosplenomegaly; liver distant $2^1/_2$ cm, spleen 3 cm. beneath the costal arch, rather dense. Regardless of the protracted course of the disease, permanent deformations of the joints were absent. The painfulness and edema of the right knee joint, recorded upon admission, subsided promptly without resorting to corticosteroid therapy.

Heart — clearly outlined tones; slight systolic sound at the cardiac apex. Blood pressure — 105/65. No data about rheumatic activity. ECG — indifferent type, sinus rhythm, frequency — 75; lengthened QT interval= =0.40".

The duodenal sounding corroborated the recurrence of cholehepatic form of lambliosis, complicated by bacterial cholangiocholecystitis. Pathogenic flora isolated from A, B and C biles. (E. paracoli and White staphylococcus). Increased content was established of mucous biliary cylinders, erythrocytes and massive lamblii in the sediment. ESR — 20 mm, eosinophilia — 11%.

After the treatment — aimed at curing the disease of the biliary tracts — the child was dismissed free of complaints, without joint changes, with stationary hepatosplenomegaly, changes in the cardiac state and ECG. At the follow-up examination, 2 years after dismissal, the patient was free of complaints. Heart — clear tones, slight systolic sound of a. pulmonalis. ECG — without pathological variations. Limbs — no objective changes. ESR — 12 mm, liver — at the costal arch, spleen — 2 cm beneath the costal arch.

In this case no convincing evidence was found of rheumatoid arthritis: permanent articular changes were absent and the paraclinical indices of rheumatic activity were negative. The articular syndrome and the manifestations on behalf of the cardiovascular system might be related to the affection of the biliary tracts. No data were present for additional infectious focus.

Most of the authors consider the cardiovascular changes in chronic hepatocholecystopathy as conditioned by the «cholecystocardiac reflex», which accounts for a number of nerve-humoral and metabolic-dystrophic derangements within the myocardium. The vegetative dystonia, associated with chronic cholecystopathy, developing against the background of the effect exerted by chronic inflammation upon the rich in interoreceptors biliary tracts and gallbladder, by way of viscero-visceral reflexes, disturbs the normal interrelationships of the processes of excitation and restoration in the myocardium. A substantial role for the occurrence of the changes in the cardiovascular system is attributed also to the toxic products, formed in the chronic focus (microbial and parasitic allergens and autoallergens), leading to hypersensibilization and changes in the immunobiological reactivity of the organism.

Arterial hypotonia and transitory bradycardia, promptly replaced by sinus tachycardia, were among the earliest manifestations of the cardiovascular changes in the children with chronic hepatocholecystopathy studied. This kind of changes were more frequently recorded in the children of age-group I (3—6 years) with duration of the disease up to 6 months (Table 3). This rather early period of functional disorders is characterized by disturbed equilibrium between the sympathetic and parasympathetic influences of the heart and blood vessels. The follow-up study of our patients shows that the manifestations of vegetative dystonia are more pronounced in the children of age group III (11 to 14 years — i. e. prepuberty and puberty age), where, along with tachycardia, sinus arrhythmia occurs also more frequently (Table 5).

These early symptoms of cardiovascular changes, produced by extracardial influences, are supplemented, at a later stage, by the dull heart sounds and systolic sound at the cardiac apex already as a manifestation of metabolic-dystrophic changes in the myocardium itself. The systolic sound and the dull heart tones were noted more frequently in the children with combined involvement of the biliary tracts by bacterial cholangiocholecystitis and hepatobiliary lambliosis with duration of the disease exceeding 1 year (Table 2).

Insofar changes occurring in the myocardium are concerned, the greatest amount of data were obtained during electrocardiographic investigations. As well known, the catecholamines, supplied by the terminations of the sympathetic nerves and by the medullar part of the adrenals as well, are quickly absorbed by the heart muscle, which conditions the intense oxygen consumption in the myocardium and leads to hypoxia and lowering of the efficiency of the heart action (Raab, Pendel, cited by R. A. Kalyuzhnaya). The latter fact clarifies to a certain degree the origin of diffuse metabolic disorders of the myocardium in chronic hepatocholecystopathy, running a course characterized by substantial weakening of the parasympathetic influence of the myocardium, and intensive and constant sympa-

thetic impulses in the neuromuscular apparatus of the heart, and more particularly in the sinus node. The constant and intense sympathetic impulses within the sinoatrial node and nerve apparatus of the atria leads to increased range of the precordial waves P in the ECG (Fig. 2) and shortening of the PQ interval (Fig. 4), as an expression of speeded up intra-atrial and atrio-ventricular conductivity. This period of overexcitation promptly results in exhaustion of the reactivity within the neuromuscular elements of the myocardium, which is followed by lowering and deflection of the P waves (Fig. 1), and in isolated cases — to relative delaying of the atrio-ventricular conductivity with elongation of the PQ interval (Fig. 3), with tachycardia and sinus arrhythmia inherent for these patients. At this, during the same period, the ECG manifestations of disturbed atrial function are supplemented by signs of disturbed functional condition of the ventricles. The altered equilibrium between the processes of excitation and restoration of the myocardium produces changes in the amplitudes of the R teeth and T waves. The normal ratio of the amplitude of R : TT=3 : 1 in leads I and II. In most of our children (65%), the ratio R : T=2 : 1. The high T waves (Fig. 5) in the later stages of the disease are substantially lowered and levelled (Figs. 1, 2, 6), as a result of exhaustion of the sympathetic reactivity and development of dystrophic processes in the myocardium. The lowering of the ST segment (Fig. 6) is a sign of disturbed trophicity within the myocardium. All changes referred to above lead to impairment of the functional capacity of the myocardium, and one of the manifestations of the ECG is the relative lengthening of the QT interval (Figs. 4, 6). These changes in the QT interval and in the T waves are related by some authors to the reduction of the total serum protein level in the blood and to the dysproteinemia, occurring as a result of a certain functional inferiority of the liver and, in turn, causing metabolic-dystrophic changes in the myocardium (I. M. Gandja, V. S. Dimitrova). Other authors (B. D. Borevskaya) proved that in chronic cholangiopathies the metabolism of electrolytes is disturbed, and more particularly, the serum level of potassium is decreased, which likewise exerts effect on the T waves and QT interval. The experimental studies of V. A. Postovit lay emphasis on the fact that the biliary acids and more particularly, the cholic and desoxycholic acids bring about changes in the ECG due to the myocardiodystrophy, hypoxia and coronary insufficiency. The studies made by E. I. Barba and N. A. Kryzhakovskii show that in patients with chronic cholecystitis, the phasic structure of the heart systole is disturbed and the contractile function of the myocardium is reduced. Subsequent to impaired metabolism of substances within the myocardium, the conversion of biochemical energy into contractile energy is slowed down and this results in energodynamical heart insufficiency.

Consequently, the concept for the functional character of the changes in the myocardium in chronic diseases of the biliary tracts appears to be conditional in most of the cases. According to literature data, the vascular, tissue and metabolic disorders, and the intoxication by microbes and parasitic allergens and autoallergens demonstrated, if acting with sufficient intensity and duration, might result, within several years (in more advanced age) in cicatricial alterations and development of focal sclerosis in the myocardium with irreversible vascular and ECG-changes (R. A. Kalyuzh-

naya). From the latter point of view, the study of the cardiovascular changes in chronic cholepathy as a focus exerting toxic and sensibilizing influence on the child's organism, depending on the duration of the disease, is of utmost interest. Thus, the paramount importance of early diagnosis and timely, energetic and complex treatment of these affections emerges, i. e. prior to the development of deeper metabolic and dystrophic changes in the myocardium. In this respect, the timely instituted treatment of the chronic diseases of the biliary tracts in childhood is assumed as a primary prophylaxis against the cardiovascular pathology in later ages.

Our studies show that the combination of chronic hepatocholecystopathy and chronic tonsillitis causes rather considerable vegetative disorders, and intensifies the sensibilization and reaction on behalf of the cardiovascular system. There is no doubt that the presence of a second focus, similarly a source of intoxication, by all means accounts for more substantial changes in the cardiovascular system as compared to the independent course run by chronic cholecystitis and chronic tonsillitis. The untoward interactions of these two chronic infections aggravate the course of chronic cholepathies and account for more long-lasting cardiovascular and ECG changes. This signifies that along with timely treatment of chronic hepatocholecystopathy, the indications for tonsillectomy are greatly extended.

Inferences

1. The investigation of 58 children, aged 3—14 years, with chronic cholecystopathy proves the presence of the following more frequent cardiovascular changes: tachycardia (45%), bradycardia (14%), dull tones (14%), systolic sound at the heart apex (46%), arterial hypotonia (59%) and ECG changes (71%).

2. According to literature data and personal observations, the genesis of the above cardiovascular changes is a complex one. Neurohumoral, metabolic-dystrophic and infectious-toxic factors bring about a number of, more or less, strongly pronounced changes in the neuro-muscular apparatus of the heart and blood vessels. The incidence and severity of these changes are directly dependent upon the duration of the disease, age of the children, the type of involvement of the biliary tracts, affection of the hepatic functions and concomitant focal infection.

3. Comparatively more frequently, we established cardiovascular changes in the children with combined involvement of the biliary tracts by bacterial cholangiocholecystitis and hepatobiliary lambliosis with duration of the affection exceeding one year, and among the group of children with ages ranging from 11 to 14 years. More pronounced and more steady are the changes established in children with clinical and paraclinical data for impairment of the liver functions and concomitant focal infection. The negative interactions between chronic cholepathies and chronic tonsillitis sharply widen the indications for tonsillectomy in similar combinations.

4. The early diagnostics and the timely, energetic and complex treatment of chronic hepatocholecystopathy in childhood, prior to the development of deeper metabolic-dystrophic changes in the myocardium, are considered as a primary prophylaxis against cardiovascular pathology in older age

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СЕРДЕЧНО-СОСУДИСТЫЕ ИЗМЕНЕНИЯ ПРИ ХРОНИЧЕСКИХ ГЕПАТОХОЛИЦЕСТОПАТИЯХ В ДЕТСКОМ ВОЗРАСТЕ

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РЕЗЮМЕ

Авторы провели наблюдения и исследования 58 детей в возрасте от 3 до 14 лет, страдающих хроническими гепатохолецистопатиями. При этом были обнаружены следующие чаще встречающиеся изменения сердечно-сосудистой системы: тахикардия (45%), брадикардия (14%), глухие тоны (14%), систолический шум сердечной верхушки (46%), артериальная гипотония (59%) и ЭКГ-изменения (71%). Генез этих сердечно-сосудистых изменений авторы объясняют нервно-гуморальными, обменно-дистрофическими и инфекционно-токсическими факторами, приводящими к целому ряду нарушений миокарда и кровеносных сосудов. Из проведенных исследований становится ясно, что частота и тяжесть этих изменений находятся в непосредственной зависимости от длительности забо-

левания, возраста детей, вида поражения желчных протоков,нарушения функций печени и сопутствующей фокальной инфекции. Контрольные осмотры и ЭКГ-исследования после проведенного комплексного лечения хронических гепатохолецистопатий и прослеживание сердечно-сосудистых изменений в динамике в течение 3-хлетнего периода после выписки детей из клиники показали исчезание артериальной гипотонии и нормализацию кровяного давления в 82%, негативирование физикальной сердечной находки в 58%, уменьшение и полное исчезание ЭКГ-изменений у 67% больных детей. Исследования проиллюстрированы 5 таблицами и 6 снимками. В заключение авторы отмечают, что ранняя диагностика и своевременное энергичное и комплексное лечение хронических гепатохолецистопатий в детском возрасте, еще до того, как разовьются более глубокие обменно-дистрофические изменения в миокарде, являются первичной профилактикой сердечно-сосудистой патологии в более позднем возрасте.